

REMARKS

This Amendment is submitted in response to the Office Action dated June 18, 2003. In the Office Action, the Patent Office objected to Claim 1 stating that the recitation of "the wall" lacks proper antecedent basis. Further, the Patent Office rejected Claim 20 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. In addition, the Patent Office rejected Claims 1, 5 and 9 under 35 U.S.C. §102(b) as being anticipated by *Mori et al.* (U.S. Patent No. 4,661,695); rejected Claims 11 and 14 under 35 U.S.C. §102(b) as being anticipated by *Lowi* (U.S. Patent No. 5,271,505); and rejected Claims 17, 18 and 20 under 35 U.S.C. §102(b) as being anticipated by *Segerson et al.* (U.S. Patent No. 4,902,903). Further, the Patent Office rejected Claims 2, 3 and 10 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Smietana* (U.S. Patent No. 5,231,959); rejected Claims 4 and 6 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Lowi, Jr.* (U.S. Patent No. 5,799,629); rejected Claim 7 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Lowi, Jr.* and further in view of *Brunet et al.* (U.S. Patent No. 6,170,573); rejected Claim 8 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.*; rejected Claims 11, 12 and 14 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.*; rejected Claim 13 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Smietana*;

rejected Claims 15 and 16 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Mori et al.*; rejected Claim 19 under 35 U.S.C. §103(a) as being unpatentable over *Segerson et al.*; and rejected Claims 21 and 22 under 35 U.S.C. §103(a) as being unpatentable over *Segerson et al.* in view of *Lowi, Jr.*.

By the present Amendment, Applicant amended Claims 1, 11 and 20. Applicant asserts that the amendments to the claims and the remarks that follow overcome the objection and rejections made by the Patent Office and places the application in condition for allowance. Notice to that effect is requested.

With respect to the objection to Claim 1 alleging that the claim has an informality, the Patent Office alleged that the phrase "the wall" lacked proper antecedent basis. In response to the objection, Claim 1 was amended by replacing "the wall" with "the body" to provide proper antecedent basis. Accordingly, Applicant submits that the objection with respect to Claim 1 has been overcome. Notice to that effect is requested.

With respect to the rejection of Claim 20 under 35 U.S.C. §112, first paragraph, the Patent Office alleges that Claim 20 fails to comply with the written description requirement. The Patent Office alleges that Claim 20 contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of

the claimed invention. More specifically, the Patent Office asserts that there is insufficient support for an embodiment in which a seal is positioned exterior to the machine element as required by Claim 20. By the present Amendment, Applicant amended Claim 20 to define the step of positioning a seal within the machine element. Applicant asserts that the positioning of a seal within the machine element is described in the specification. Moreover, Applicant asserts that, for the foregoing reasons, the specification conveys subject matter in such a way as to reasonably convey to one skilled in the art that the Applicant, at the time the application was filed, had possession of the claimed invention. Therefore, the rejection of Claim 20 under 35 U.S.C. §112, first paragraph, has been overcome and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 1, 5 and 9 under 35 U.S.C. §102(b) as being anticipated by *Mori et al.* (U.S. Patent No. 4,661,695). The Patent Office alleged that:

Mori et al. disclose (see Figure 1) an apparatus for measuring displacement, comprising: a machine element (2) having an interior wall, an exterior wall and a first end wall (between V1 and V2) enclosing the interior wall; a shaft element (attached to 3) within the machine element; a head element (3) attached to the shaft element adjacent to the interior wall; a light source (within 4; 44 of Figure 2) attached to the machine element; and a sensor (45 of Figure 2) attached to the machine element and positioned to detect intensity of light within the machine element wherein the intensity of light corresponds to a position of the head element within the machine element at any point between the first end and the second end (see Figures 6 and 7). *Mori et al.*

further disclose (see Figure 2) an second sensor (other instance of 45) attached to the first wall. Further, since the walls and ends of *Mori et al.* can be designated as first or second or vice versa, *Mori et al.* disclose the light source is attached at a first or second wall.

However, independent Claim 1, as amended, defines an apparatus for measuring displacement having a machine element which has a light source within the interior surface of the machine element. Moreover, Claim 1 requires a sensor within the interior surface of the machine element positioned to detect intensity of light within the machine element.

On the contrary, *Mori et al.* merely teach an apparatus which detects a position of a piston when the piston reaches a top dead center position in an engine. Further, *Mori et al.* teach "the cylinder head 2 is provided with a TDC position detector 4 penetrating therethrough. The lower half of the detector 4 is screwed to the cylinder head 2." (See *Mori et al.*, Col. 2, lines 34-36.) Still Further, *Mori et al.* merely teach "the upper end of the fiber 43a acting as a light inlet path is connected to a light emission element 44 such as a light emission diode provided within the upper half portion 40a." (See *Mori et al.*, Col 2, lines 59-62.) Moreover, *Mori et al.* merely teach "the upper end of each fiber 43b acting as a light outlet path is connected to a light reception element such as a photo diode. The light emission element 44 and the light reception elements 45 are secured to a printed circuit board 46." (See *Mori et al.*, Col. 2, lines 63-67.)

Contrary to the assertions of the Patent Office, *Mori et al.* do not teach or suggest an apparatus for measuring displacement having a light source within the interior surface of the machine element as required by Claim 1. Further, *Mori et al.* do not teach or suggest a sensor within the interior surface of the machine element positioned to detect intensity of light within the machine element as required by Claim 1.

Moreover, *Mori et al.* actually teach away from the apparatus for measuring displacement having the light source within the interior surface of the machine element because the light emission diode is only provided within the upper half portion of the TDC position detector. The light emission diode of *Mori et al.* is not located within the combustion chamber and is actually located outside of the cylinder head. Further, *Mori et al.* also teach away from the sensor within the interior surface of the machine element because the upper end of each fiber 43b is connected to a light reception element. The light reception element of *Mori et al.* is also not located within the combustion chamber and is actually located outside of the cylinder head. Thus, *Mori et al.* clearly teach away from the light source within the interior of the machine element and the sensor within the interior surface of the machine element as specifically defined in Claim 1.

With respect to the rejection of Claims 1, 5 and 9 under 35 U.S.C. §102(b), anticipation requires that a single reference

discloses each and every element of Applicant's claimed invention.

Akzo N.V. v. U.S. International Trade Commission, 808 F.2d 1471, 1479, 1 USPQ 2d. 1241, 1245 (Fed. Cir. 1986). Moreover, anticipation is not shown even if the differences between the claims and the reference are "insubstantial" and one skilled in the art could supply the missing elements. *Structure Rubber Products Co. v. Park Rubber Co.*, 749 F.2d. 707, 716, 223 USPQ 1264, 1270 (Fed. Cir. 1984).

Since *Mori et al.* fail to disclose the elements defined in amended Claim 1, the rejection under 35 U.S.C. §102(b) has been overcome and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 11 and 14 under 35 U.S.C. §102(b) as being anticipated by *Low* (U.S. Patent No. 5,271,505). The Patent Office alleged that:

Low discloses (see Figures 2) an apparatus for cleaning a machine component, comprising: a machine element (16) having a body defining an interior wherein the body has an interior surface and a length defined between a first end (top) and second end (bottom); a shaft element (33) movable within the machine element; and a head element (screw at arrow) attached to the shaft element and adjacent to the interior wall of the machine element; and a first brush (32) positioned at the end wall of the machine element in contact with the shaft element. *Low* further discloses (see Figure 2) a second brush (matching brush on the right; not labeled) positioned exterior to the body of the machine element.

However, independent Claim 11, as amended, defines an apparatus for cleaning a machine component having a first brush

which is positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element.

On the contrary, *Low* merely teaches a colour sorting machine for sorting material into desired and undesired portions. Further, *Low* teaches "each cleaning-calibration member 31 comprises a wiper brush 32 which is secured to the lower end of a light-reflecting white or otherwise coloured calibration block 33. Each cleaning-calibration member 31 is mounted in a housing 34 which is arranged to be moved by a piston 35 of an hydraulically or pneumatically actuated wiper cylinder 36 (See *Low*, Col. 3, lines 37-43.) Still further, *Low* merely teaches "each wiper brush 32 is aligned with its respective transparent tube 16 so that, on operation of the piston 35, the wiper brush 32 is moved down and up in contact with the wall of the transparent tube 16 so as to clean the said wall." (See *Low*, Col. 3, lines 49-53.) Moreover, *Low* merely teaches "it is preferred that the wiper brush 32 has made three (i.e. down-up-down) cleaning movements over the said wall before calibration occurs." (See *Low*, Col. 4, lines 3-6.)

Contrary to the assertions of the Patent Office, *Low* does not teach or suggest an apparatus for cleaning a machine component having a first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element as required by Claim 11.

Moreover, *Low* actually teaches away from the apparatus for

cleaning a machine component having the first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element because the wiper brush 32 moves down and up in contact with the wall of the transparent tube so as to clean the wall. More specifically, *Low* teaches "each wiper brush 32 is aligned with its respective transparent tube 16 so that, on operation of the piston 35, the wiper brush 32 is moved down and up in contact with the wall of the transparent tube 16 so as to clean the said wall." (See *Low*, Col. 3, lines 49-53.) Further, the wiper brush of *Low* is not positioned on the transparent tube and is actually positioned on the piston which moves down and up in the transparent tube. Thus, *Low* clearly teaches away from the first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element as specifically defined in Claim 11.

With respect to the rejection of Claims 11 and 14 under 35 U.S.C. §102(b), anticipation requires that a single reference discloses each and every element of Applicant's claimed invention. *Akzo N.V. v. U.S. International Trade Commission*, 808 F.2d 1471, 1479, 1 USPQ 2d. 1241, 1245 (Fed. Cir. 1986). Moreover, anticipation is not shown even if the differences between the claims and the reference are "insubstantial" and one skilled in the art could supply the missing elements. *Structure Rubber Products Co. v. Park Rubber Co.*, 749 F.2d. 707, 716, 223 USPQ 1264, 1270

(Fed. Cir. 1984).

Since Low fails to disclose a first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element as defined in amended Claims 11, the rejection under 35 U.S.C. §102(b) has been overcome and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 17, 18 and 20 under 35 U.S.C. §102(b) as being anticipated by Segerson et al. (U.S. Patent No. 4,902,903). The Patent Office alleged that:

Segerson et al. disclose (see Figures 3 and 4) a method for measuring displacement of a machine element, comprising: providing a machine element (40) having a body (within 40) defining an interior wherein the body has an interior surface and a length defined between a first end (left side) and a second end (right side); providing a shaft element (16) capable of movement within the machine element; attaching a head element (at 18; not labeled) to the shaft element; attaching a light source (44E) to the machine element on a first side of the head element; attaching a light sensor (44R) to the machine element on a second side of the head element wherein the first side and the second side are not the same; and measuring intensity of light within the machine element from reflected light detected by the sensor. Segerson et al. also disclose (see Figure 3) moving (28) the shaft element; and producing an output signal as the shaft element moves within the machine element. Segerson et al. further disclose (see Figure 4) a seal (55) exterior to the machine element.

However, independent Claim 17 requires a method for measuring displacement of a machine element having the step of attaching a light source to the machine element on a first side of the head element. Further, Claim 17 requires the step of attaching a sensor

to the machine element on a second side of the head element wherein the first side and the second side are not the same.

On the contrary, *Segerson et al.* merely teach a vehicle height sensor and automotive leveling system. Further, *Segerson et al.* teach "emitter 44E and receiver 44R of emitter-receiver pair 44 are mounted in spaced-apart fashion in mounting block 48 and coupled to connectors 49." (See *Segerson et al.*, Col. 5, lines 21-24.) Still Further, *Segerson et al.* merely teach "emitter 44E and receiver 44R have lenses 47E and 47R, respectively, and are oriented so as to point at shaft 16 running along the central axis of air shock 40." (See *Segerson et al.*, Col. 5, lines 21-24.)

Contrary to the assertions of the Patent Office, *Segerson et al.* do not teach or suggest a method for measuring displacement of a machine element having the steps of attaching a light source to the machine element on a first side of the head element and attaching a sensor to the machine element on a second side of the head element wherein the first side and the second side are not the same as required by Claim 17. Moreover, *Segerson et al.* actually teach away from the method defined by Claim 17 because the emitter 44E and receiver 44R are attached to the same side of the head element (at 18; not labeled).

With respect to the rejection of Claims 17, 18 and 20 under 35 U.S.C. §102(b), anticipation requires that a single reference discloses each and every element of Applicant's claimed invention.

Akzo N.V. v. U.S. International Trade Commission, 808 F.2d 1471, 1479, 1 USPQ 2d. 1241, 1245 (Fed. Cir. 1986). Moreover, anticipation is not shown even if the differences between the claims and the reference are "insubstantial" and one skilled in the art could supply the missing elements. *Structure Rubber Products Co. v. Park Rubber Co.*, 749 F.2d. 707, 716, 223 USPQ 1264, 1270 (Fed. Cir. 1984).

Since Segerson et al. fail to disclose the steps of attaching a light source to the machine element on a first side of the head element and attaching a sensor to the machine element on a second side of the head element wherein the first side and the second side are not the same as defined in Claims 17, the rejection under 35 U.S.C. §102(b) is improper and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 11, 12 and 14 under 35 U.S.C. §103(a) as being unpatentable over Lowi, Jr. (U.S. Patent No. 5,799,629). The Patent Office alleged that:

Lowi, Jr. discloses (see Figures 1 and 6) an apparatus for cleaning a machine component, comprising: a machine element (cylinder) having a body (cylinder) defining an interior wherein the body has an interior surface and a length defined between a first end and a second end; a shaft element (piston shaft; 75 of Figure 6) movable within the machine element; and a head element (piston) attached to the shaft element and adjacent to the interior wall of the machine element; and a first brush and second brush (77) positioned in contact with the shaft element. Lowi, Jr. does not specifically disclose the position of the brush with respect to the body of the machine element. However, Lowi, Jr. teaches (see Figure 1) the head element being able to freely move within the

body. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the brushes of *Lowi, Jr.* at an exterior of the body in order to not interfere with the movement of the head element and maximize the moveable range of the head element.

However, independent Claim 11, as amended, defines an apparatus for cleaning a machine component. The apparatus has a first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element.

Contrary to the assertions of the Patent Office, *Lowi, Jr.* merely teaches structural improvements to uncooled, two-stroke-cycle, opposed-piston, uniflow-scavenging internal combustion engines. Moreover, *Lowi, Jr.* teaches that the floating brushes 77 are in contact with the loaded sides of the piston rod 75 and are captured axially and tangentially between the end plates and the side plates which may provide running adjustment for wear thereby avoiding the development of excess clearances.

Moreover, *Lowi, Jr.* does not teach or suggest an apparatus for cleaning a machine component having a first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element as required by Claim 11. Further, *Lowi, Jr.* actually teaches away from the first brush positioned on an exterior wall of the first end of the body wherein the first brush contacts the shaft element because the brush 77 is positioned on the interior surface of the body in contact the shaft element. More specifically, *Lowi, Jr.* teaches rotational restraint about the

axis of the follower/piston assembly is provided by the fit of the rectangular-section rod 75 in its similarly proportioned crosshead bearings 77 and 79. Therefore, Lowi, Jr. merely teaches that the brushes 77 must be positioned within the body and in contact with the shaft element to eliminate the need for additional rollers and/or rails. Thus, Lowi, Jr. clearly teaches away from the first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element as specifically defined by Claim 11.

Moreover, with respect to the rejection of Claims 11, 12 and 14 under 35 U.S.C. §103(a), one of ordinary skill in the art would never have been motivated to modify Lowi, Jr. in the manner suggested by the Patent Office in formulating the rejection of the claims under 35 U.S.C. §103(a). It is submitted that the question under §103 is whether the art would suggest the claimed invention to one of ordinary skill in this art. In re Simon, 461 F.2d 1387, 174 USPQ 114 (CCPA 1972).

That elements, even distinguishing elements, are disclosed in the art is alone insufficient. It is common to find elements somewhere in the art. Moreover, most if not all elements perform their ordained and expected functions. The test is whether the invention as a whole, in light of the teachings of the reference in its entirety, would have been obvious to one of ordinary skill in the art at the time the invention was made. Connell v. Sears,

Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983).

It is insufficient that the art disclosed components of Applicants' invention. A teaching, suggestion, or incentive must exist to make the modification made by Applicant. Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1988).

In view of the foregoing remarks and amendments, Applicant respectfully submit the rejection of Claims 11, 12 and 14 under 35 U.S.C. §103(a) has been overcome and should be withdrawn. Notice to that effect is requested.

With respect to the rejection of Claims 2, 3 and 10 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Smietana*, Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since neither *Mori et al.* nor *Smietana*, taken singly or in combination, teach or suggest the light source on the interior surface of the machine element and the sensor on the interior surface of the machine element as specifically defined in Claim 1. Notice to that effect is requested.

With respect to the rejection of Claims 4 and 6 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Lowi, Jr.*, Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since neither *Mori et al.* nor *Lowi, Jr.*, taken singly or in combination, teach or

suggest the light source on the interior surface of the machine element and the sensor on the interior surface of the machine element as specifically defined in Claim 1. Notice to that effect is requested.

With respect to the rejection of Claim 7 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.* in view of *Lowi, Jr.* and further in view of *Brunet et al.*, Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since none of *Mori et al.*, *Lowi, Jr.* or *Brunet et al.*, taken singly or in combination, teach or suggest the light source on the interior surface of the machine element and the sensor on the interior surface of the machine element as specifically defined in Claim 1. Notice to that effect is requested.

With respect to the rejection of Claim 8 under 35 U.S.C. §103(a) as being unpatentable over *Mori et al.*, Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since *Mori et al.* do not teach or suggest the light source on the interior surface of the machine element and the sensor on the interior surface of the machine element as specifically defined in Claim 1. Notice to that effect is requested.

With respect to the rejection of Claim 13 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Smietana*,

Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since neither *Lowi, Jr.* nor *Smietana*, taken singly or in combination, teach or suggest the first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element as defined in Claim 11. Notice to that effect is requested.

With respect to the rejection of Claims 15 and 16 under 35 U.S.C. §103(a) as being unpatentable over *Lowi, Jr.* in view of *Mori et al.*, Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since neither *Lowi, Jr.* nor *Mori et al.*, taken singly or in combination, teach or suggest the first brush positioned on the exterior wall of the first end of the body wherein the first brush contacts the shaft element as specifically defined in Claim 11. Notice to that effect is requested.

With respect to the rejection of Claim 19 under 35 U.S.C. §103(a) as being unpatentable over *Segerson et al.*, Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since *Segerson et al.* do not teach or suggest the steps of attaching a light source to the machine element on a first side of the head element and attaching a sensor to the machine element on a second side of the head element wherein the first side and the second side are not the same as specifically defined in Claim 17. Notice to that effect is requested.

With respect to the rejection of Claims 21 and 22 under 35 U.S.C. §103(a) as being unpatentable over *Segerson et al.* in view of *Lowi, Jr.*, Applicant respectfully submits that the rejection has been overcome for the same reasons set forth above since neither *Segerson et al.* nor *Lowi, Jr.*, taken singly or in combination, teach or suggest the steps of attaching a light source to the machine element on a first side of the head element and attaching a sensor to the machine element on a second side of the head element wherein the first side and the second side are not the same as specifically defined in Claim 17. Notice to that effect is requested.

Moreover, none of the above-mentioned references, either singly or in combination, teach the elements of independent Claims 1, 11 and 17. Claims 2-10 depend from Claim 1; Claims 12-16 depend from Claim 11; and Claims 18-22 depend from Claim 17. These claims are further believed allowable over the references of records since each sets forth additional structural elements and novel steps of Applicant's apparatus, system and method for position monitoring and/or cleaning of a machine element.

In view of the foregoing remarks and amendments, Applicant respectfully submits that all of the claims in the application are in allowable form and that the application is now in condition for allowance. Further, Applicant submits that neither further search nor consideration would be necessitated by entry of this Amendment;

therefore, entry of this Amendment is proper and should be effected.

If, however, any outstanding issues remain, Applicant urges the Patent Office to telephone Applicant's attorney so that the same may be resolved and the application expedited to issue. Applicant requests the Patent Office to indicate all claims as allowable and to pass the application to issue.

Respectfully submitted,



(Req. No. 35,018)

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CERTIFICATE OF MAILING

I hereby certify that this **Amendment After Final** is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on July 28, 2003.



Brian M. Mattson